Tentative

IPS Alpha Technology, Ltd.

TECHNICAL DATA

AX080B048G

CONTENTS

RECORD OF REVISION

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DESCRIPTION

The following specifications are applied to the following TFT module.
Note : Inverter for back light unit is built in this module.

Product Name : AX080B048G

General Specifications

Effective Display Area	: (H)697.685×(V)392.256	(mm)
Number of Pixels	: (H)1,366×(V)768	(pixels)
Pixel Pitch	: (H)0.51075×(V)0.51075	(mm)
Color Pixel Arrangement	: R+G+B Vertical Stripe	
Display Mode	: Transmissive Mode Normally Black Mode	
Top Polarizer Type	: Semi-Glare	
Number of Colors	: 16,777,216	(colors)
Viewing Angle Range	: Wide Version (Horizontal & Vertical : 170°at φ=0°,90°, 180°,270°, CR≧10)	
Input Signal	: 1-channel LVDS (LVDS:Low Voltage Differential Signaling)	
Back Light	: 8pcs. of CCFL	
External Dimensions	: (H)760.0 x (V)450.0 x (t)48.0Max	(mm)
Weight	:TBD	(g)

1. ABSOLUTE MAXIMUM RATINGS

1.1 Environmental Absolute Maximum Ratings

ITEM	Operating		Storage		Unit	Note
	Min.	Max.	Min.	Max.		
Temperature	0	50	-20	60	℃	1),5)
Humidity	2)		2)		%RH	1)
Vibration	-	4.9(0.5G)	-	TBD	m/s2	3)
Shock	-	29.4(3G)	-	TBD	m/s2	4)
Corrosive Gas	Not Acceptable		Not Acceptable		-	

Note 1) Temperature and Humidity should be applied to the glass surface of a TFT module,
　　　　　not to the system installed with a module.
　　　　　The temperature at the center of rear surface should be less than 70℃ on the condition of operating.
　　　　　The brightness of a CCFL tends to drop at low temperature. Besides, the life-time becomes shorter
　　　　　at low temperature.
　　　2) $Ta \leqq 40$ ℃······Relative humidity should be less than 85%RH max. Dew is prohibited.
　　　　　$Ta > 40$ ℃······Relative humidity should be lower than the moisture of the 85%RH at 40℃.
　　　3) Frequency of the vibration is between 15Hz and 100Hz. (Remove the resonance point)
　　　4) Pulse width of the shock is 10 ms.
　　　5) Long operation under low temperature may cause some portion of display area to be reddish for
　　　　　several minutes after turning on the product.
　　　　　However, it does not affect the characteristics and reliability of the product.

1.2 Electrical Absolute Maximum Ratings

(1)TFT Module　　　　　　　　　　　　　　　　　　　　　　　　　　　　Vss = 0 V

ITEM	SYMBOL	Min.	Max.	Unit	Note
Power Supply Voltage	V DD	0	13.2	V	
Input Voltage for logic	V 1	-0.3	3.6	V	1)
Electrostatic Durability	V ESD0	±100		V	2),3)
	V ESD1	±8		kV	2),4)

Note　1)It is applied to pixel data signal and clock signal.
　　　　2)Discharge Coefficient：200pF-250Ω, Environmental：25℃-70%RH
　　　　3)It is applied to I/F connector pins.
　　　　4)It is applied to the surface of a metallic bezel and a LCD panel.

(2) Back-light Inverter　　　　　　　　　　　　　　　　　　　　　　　　Vss = 0 V

ITEM	SYMBOL	Min.	Max.	Unit	Note
Input Voltage	Vin	0	26.4	V	
ON/OFF Control Input Voltage	ON/OFF	0	6.0	V	
Brightness Control Voltage	PWM	0	3.3	V	

2. INITIAL OPTICAL CHARACTERISTICS

The following optical characteristics are measured under stable conditions. It takes about 30 minutes
to reach stable conditions. The measuring point is the center of display area unless otherwise noted.
The optical characteristics should be measured in a dark room or equivalent state.
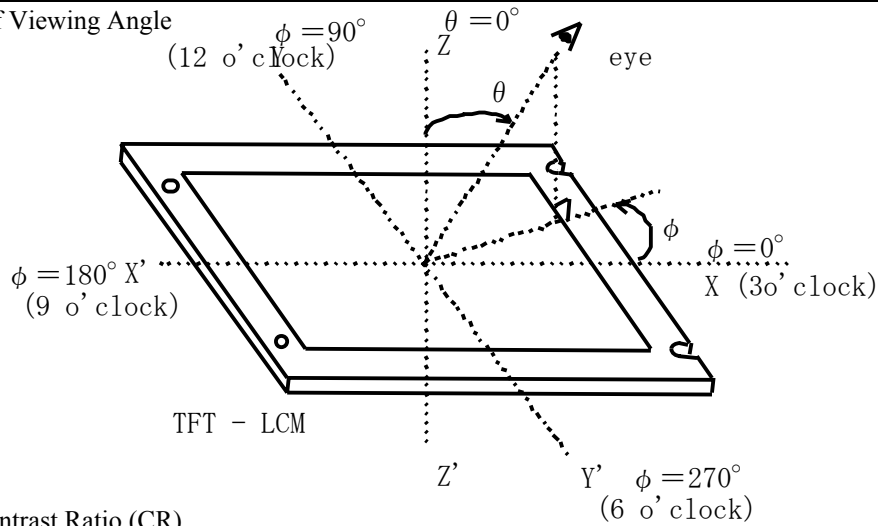
Measuring equipment : CS-1000A, or equivalent

Ambient Temperature =25℃、VDD=12.0V、ｆV=60Hz、

VBL=24V、 PWM on duty =100%

ITEM		SYMBOL	CONDITION	Min.	Typ.	Max.	UNIT	NOTE
Contrast Ratio		C R		500	1000	-	-	2)
Response Time	Rise	ton		-	8	20	ms	3)
	Fall	toff		-	6	20	ms	3)
Brightness of white		Bwh		350	450	-	cd/m^2	
Brightness uniformity		Buni		-	-	30	%	4)
Color Chromaticity (CIE)	Red	χ	θ＝0° 1)	0.62	0.65	0.68	-	【Gray scale =255】
		y		0.30	0.33	0.36		
	Green	χ		0.27	0.30	0.33		
		y		0.59	0.62	0.65		
	Blue	χ		0.12	0.15	0.18		
		y		0.04	0.07	0.10		
	White	χ		0.250	0.280	0.310		
		y		0.260	0.290	0.320		
Variation of Color Position (CIE)	Red	Δχ	θ＝+50° φ＝0°、90° 180°、270° 1)	-	-	0.04	-	5) 【Gray scale =255】
		Δy		-	-	0.04		
	Green	Δχ		-	-	0.04		
		Δy		-	-	0.04		
	Blue	Δχ		-	-	0.04		
		Δy		-	-	0.04		
	White	Δχ		-	-	0.04		
		Δy		-	-	0.04		
Contrast Ratio at 85°		CR85		10	-	-	-	Estimated value

Note 1) Definition of Viewing Angle

$\phi = 90°$
(12 o'clock)

$\theta = 0°$ eye

θ

$\phi = 180°$ X'
(9 o'clock)

ϕ

$\phi = 0°$
X (3o'clock)

TFT − LCM

Z'   Y' $\phi = 270°$
(6 o'clock)
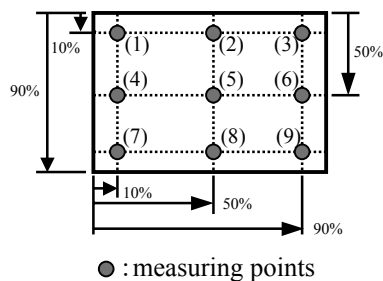
2) Definition of Contrast Ratio (CR)

$$CR = \frac{(\text{Luminance at displaying WHITE})}{(\text{Luminance at displaying BLACK})}$$

3) Definition of Response Time

| Displaying Data Signal | BLACK | WHITE | BLACK |

ton   toff

Optical Response (Luminance)

%
100
90

10
0

4）Definition of Brightness Uniformit Display pattern is white (255 level) . The brightness uniformity is defined as the following equation. Brightness at each point is measured, and average, maximum and minimum brightness is calculated.

10%
90%
50%
(1) (2) (3)
(4) (5) (6)
(7) (8) (9)
10% 50%
90%

● : measuring points

$$Buni = \frac{|\ Bmax \text{ or } Bmin - Bave\ |}{Bave} \times 100$$

where, Bmax = Maximum brightness
Bmin = Minimum brightness

$$Bave = \text{Average brightness} = \frac{\sum_{k=1}^{9}(B(k))}{9}$$

5）Variation of color position on CIE is defined as difference between colors at θ=0°and
atθ＝+50°& φ=0°90°180°270°.

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3. ELECTRICAL CHARACTERISTICS

3.1 TFT-LCD Module

Ta=25℃、Vss=0V

ITEM	SYSTEM	Min.	Typ	Max	単位	備考
Power supply Voltage	V_{DD}	11.4	12.0	12.6	V	
Power supply Current	I_{DD}	-	0.39	0.6	A	1),2)
Ripple voltage of power Supply	V_{DDR}	-	-	350	mV	

Note 1)fV=60.0Hz，fCLK=82MHz，VDD=12.0V，and Display pattern is white.

DC Ampere Meter

TFT Module

VDD

VSS

2) Current fuse is built in a module. Current capacity of power supply for VDD

should be larger than 4A, so that the fuse can be opened at the trouble of electrical circuit of module.

3.2 Back Light

ITEM		Symbol	Min.	Typ.	Max.	Unit	Notes
Input Voltage		VBL	21.6	24.0	26.4	V	
Input Current		IBL	-	3.2	-	A	VBL=24V, PWM on Duty100% ,3)
ON/OFF Control Voltage	ON	ON/OFF	2.0	-	5.0	V	
	OFF		0	-	0.8	V	
Brigthness Control Input Voltage	Min. Brightness	PWM	-	0	-	V	
	Max. Brightness		-	-	3.3	V	
PWM Duty	Min. Brightness	on-Duty	-	(20)	-	%	
	Max. Brightness		-	-	100		

Note   3)This characteristics should be applied putting on the lamp about 60 minutes later

with ambient temperature. (Ta=25℃±2℃)

4. BLOCK DIAGRAM

(1) TFT Module

(2) Back light unit

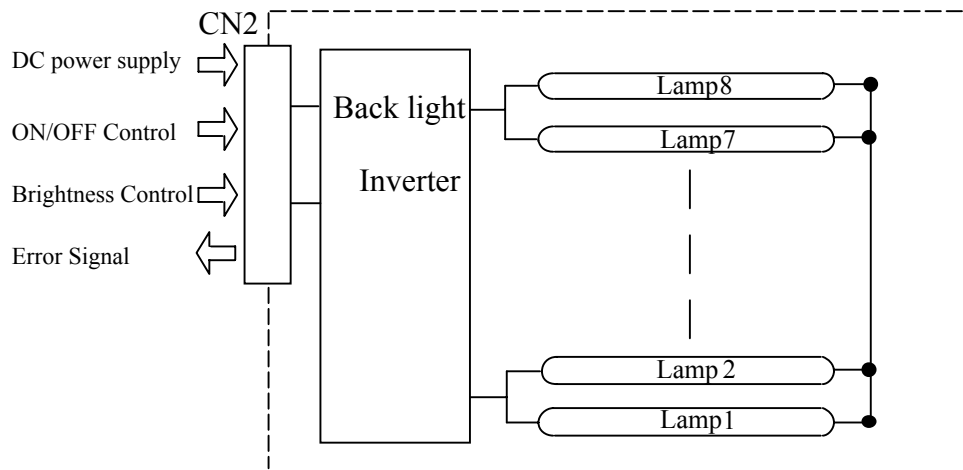| IPS Alpha Technology, Ltd. | Date | Dec. 05, 2008 | Sheet No. | ATD0934　2607　AX080B048G | Page | 7-1/1 |

5. INTERFACE PIN ASSIGNMENT

5. 1 TFT-LCD MODULE

CN1:JAE FI-X30SSL-HF

(Matching connector : JAE FI-X30C2L)

Pin No.	SYMBOL	Description	Note
1	VDD	Power Supply (typ.+12V)	1)
2	VDD		
3	VDD		
4	VDD		
5	VSS	GND(0V)	2)
6	VSS		
7	VSS		
8	VSS		
9	IC	Internally Connected, Keep Open	
10	IC		
11	VSS	GND(0V)	
12	Rx0-	Pixel Data	3)
13	Rx0+		
14	VSS	GND(0V)	2)
15	Rx1-	Pixel Data	3)
16	Rx1+		
17	VSS	GND(0V)	2)
18	Rx2-	Pixel Data	3)
19	Rx2+		
20	VSS	GND(0V)	2)
21	CLK-	Pixel Data	3)
22	CLK+		
23	VSS	GND(0V)	2)
24	Rx3-	Pixel Data	3)
25	Rx3+		
26	VSS	GND(0V)	2)
27	IC	Internally Connected, Keep Open	
28	IC		
29	IC		
30	IC		

Notes   1) All VDD pins shall be connected to +12.0V(Typ.).

2) All VSS pins shall be grounded. Metal bezel is internally connected to VSS.

3) Rx n+ and Rx n- (n=0,1,2,3) should be wired by twist-pairs or side-by-side FPC patterns, respectively.

5. 2 Back light unit
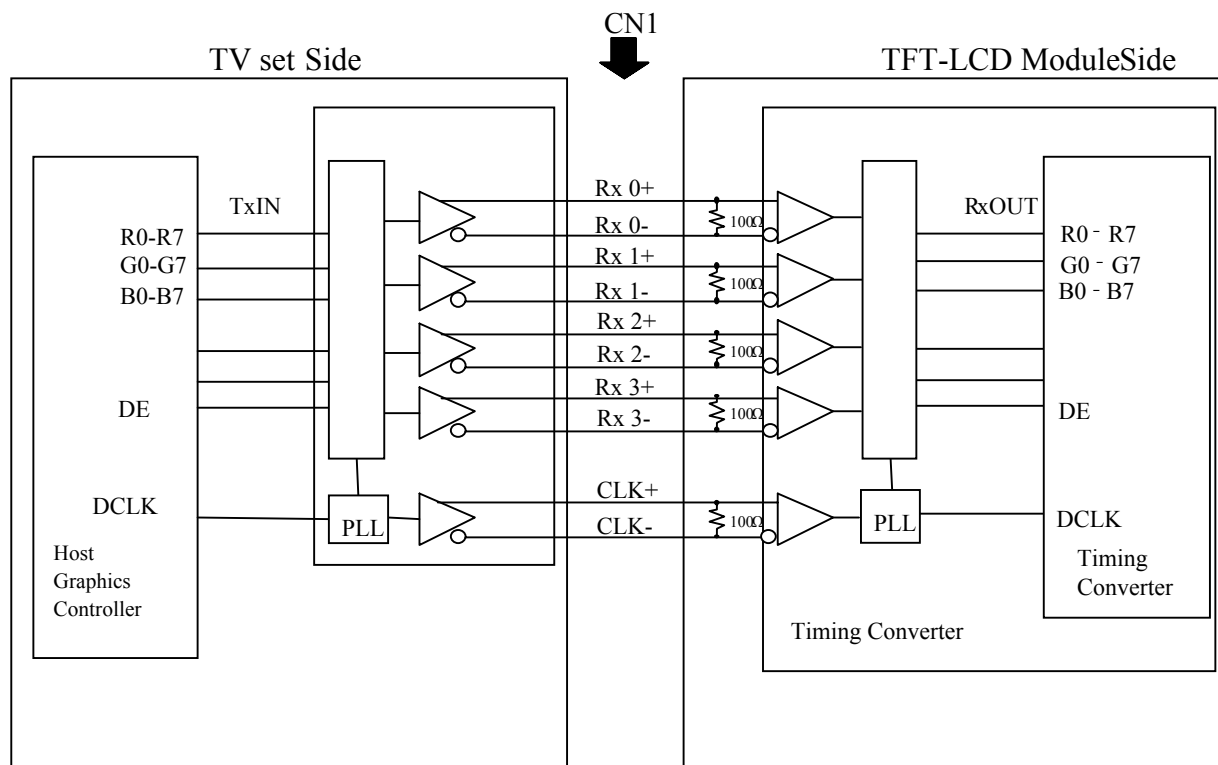
Inverter pin assignment

JST S14B-PHA-SM-TB(LF)(SN)

(Matching connector : JST PHR-14)

PIN No.	SYMBOL	DESCRIPTION	NOTE
1	Vin		
2	Vin		
3	Vin	Power supply (Typ. +24.0V)	1)
4	Vin		
5	Vin		
6	Vss		
7	Vss		
8	Vss	GND (0V)	2)
9	Vss		
10	Vss		
11	FAIL	Status output (Normal:GND abnormal:open)	
12	ON/OFF	High : LAMP ON(3.3V) Low : LAMP OFF	
13	PWM	14pin low:0-3.3V pulse (120-240Hz ON duty 20-100%)	
14	SELECT	Low:external pwm dimming	

Note 1) All Vin pins shall be connected to +24.0V(Typ.).

2) All Vss pins shall be grounded. Metal bezel is internally connected to Vss.

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5.3 BLOCK DIAGRAM OF INTERFACE

R0～R7	: Pixel R Data	(7; MSB, 0; LSB)
G0～G7	: Pixel G Data	(7; MSB, 0; LSB)
B0～B7	: Pixel B Data	(7; MSB, 0; LSB)
DE	: Data Enable	

Notes 1) The system must have the transmitter to drive the module.
2) LVDS cable impedance shall be 50 ohms per signal line or about 100 ohms per twist-pair line
when it is used differentially.

SIGNAL	TRANSMITTER THC63LVDM83A		INTERFACE CONNECTOR		TFT CONTROL INPUT
	PIN	INPUT	TV Set	TFT-LCD	
R2	51	Tx IN0			R2
R3	52	Tx IN1			R3
R4	54	Tx IN2	TA OUT0+	Rx 0+	R4
R5	55	Tx IN3			R5
R6	56	Tx IN4			R6
R7	3	Tx IN6	TA OUT0-	Rx 0-	R7
G2	4	Tx IN7			G2
G3	6	Tx IN8			G3
G4	7	Tx IN9			G4
G5	11	Tx IN12	TA OUT1+	Rx 1+	G5
G6	12	Tx IN13			G6
G7	14	Tx IN14			G7
B2	15	Tx IN15	TA OUT1-	Rx 1-	B2
B3	19	Tx IN18			B3
B4	20	Tx IN19			B4
B5	22	Tx IN20			B5
B6	23	Tx IN21	TA OUT2+	Rx 2+	B6
B7	24	Tx IN22			B7
-	27	Tx IN24			not connected
-	28	Tx IN25	TA OUT2-	Rx 2-	not connected
DE	30	Tx IN26			DE
R0	50	Tx IN27			R0
R1	2	Tx IN5			R1
G0	8	Tx IN10	TA OUT3+	Rx 3+	G0
G1	10	Tx IN11			G1
B0	16	Tx IN16			B0
B1	18	Tx IN17	TA OUT3-	Rx 3-	B1
RSVD 1)	25	Tx IN23			not connected
DCLK	31	TxCLK IN	TxCLK OUT+	RxCLK IN+	DCLK
			TxCLK OUT-	RxCLK IN-	

(Note: "24bit" spans the SIGNAL column for all data rows.)

R0～R7 :Pixel B Data (7;MSB, 0;LSB)

G0～G7 :Pixel B Data (7;MSB, 0;LSB)
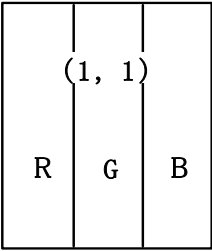
B0～B7 :Pixel B Data (7;MSB, 0;LSB)

DE   :Data Enable

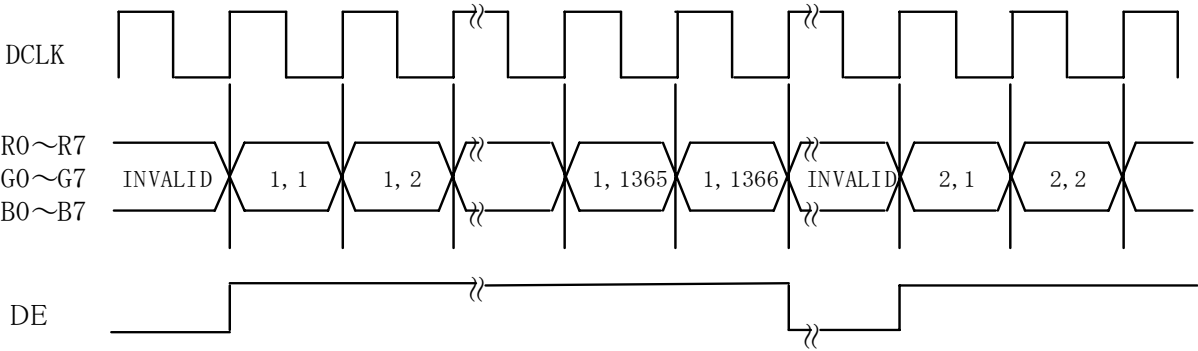Notes 1) RSVD(reserved) pins on the transmitter shall be tied to"H"or"L".

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5.5 CORRESPONDENCE BETWEEN INPUT DATA AND DISPLAY IMAGE

Display data of adjacent one pixel is latched during one cycle of DCLK.

(1, 1)

| R | G | B |

pixel : R0～R7 :R data
G0～G7 :G data
B0～B7 :B data

1, 1	1, 2	1, 3	– – – – – – – – – – – – –	1, 1366
2, 1	2, 2	2, 3	– – – – – – – – – – – – –	2, 1366
3, 1	3, 2	3, 3	– – – – – – – – – – – – –	3, 1366
┊	┊	┊		┊
768, 1	768, 2	768, 3	– – – – – – – – – – – – –	768, 1366

DCLK

R0～R7
G0～G7   INVALID   1, 1   1, 2   1, 1365   1, 1366   INVALID   2, 1   2, 2
B0～B7

DE

5.6 RELATIONSHIP BETWEEN DISPLAY COLORS AND INPUT SIGNALS

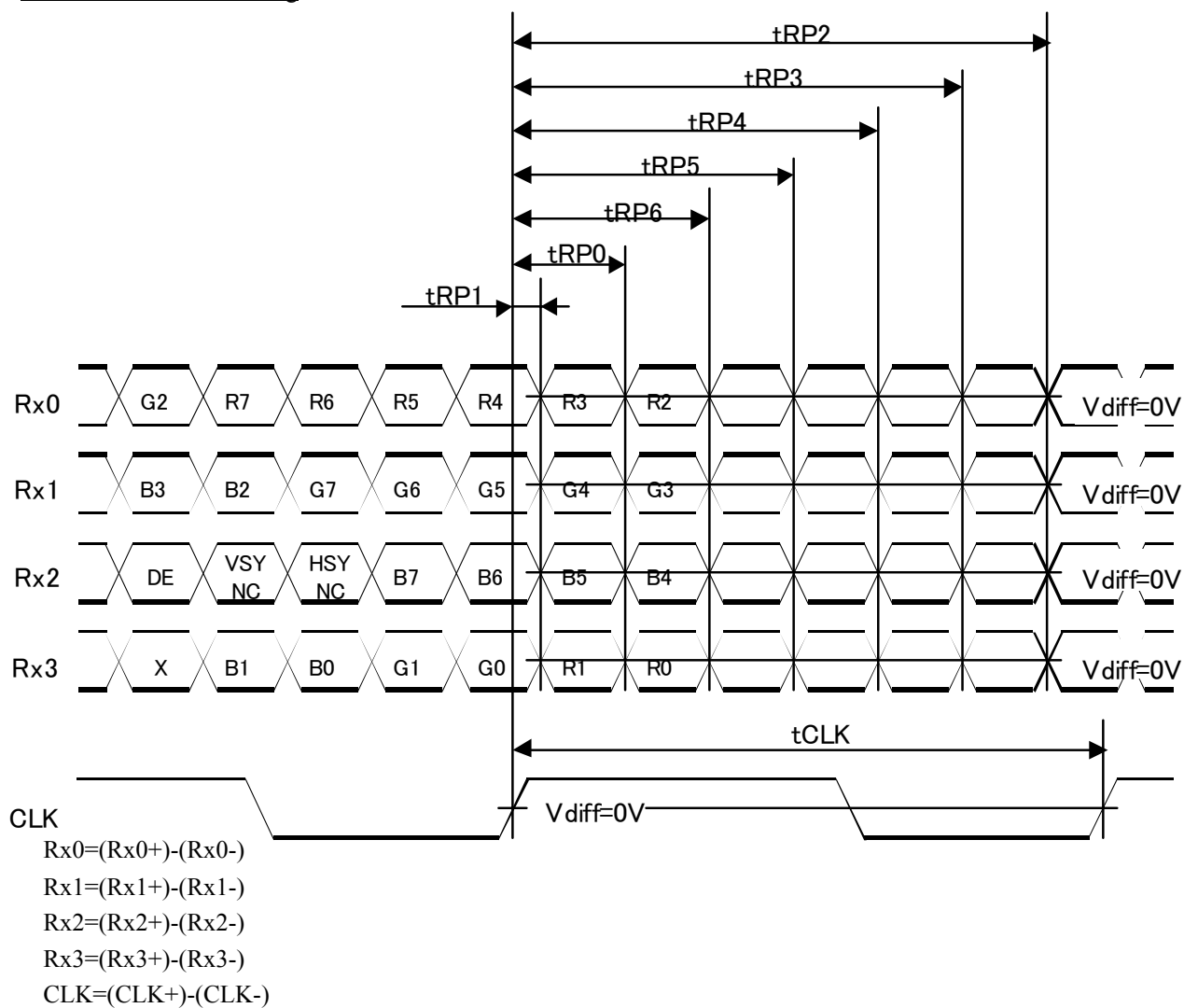| Color / Input		Red Data R7	R6	R5	R4	R3	R2	R1	R0	Green Data G7	G6	G5	G4	G3	G2	G1	G0	Blue Data B7	B6	B5	B4	B3	B2	B1	B0
		MSB							LSB	MSB							LSB	MSB							LSB
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
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	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green(255)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
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	Blue (254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue (255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

Notes   1) Definition of gray scale:

Color(n) ・・・・ Number in parenthesis indicates gray scale level. Larger n corresponds to brighter level.
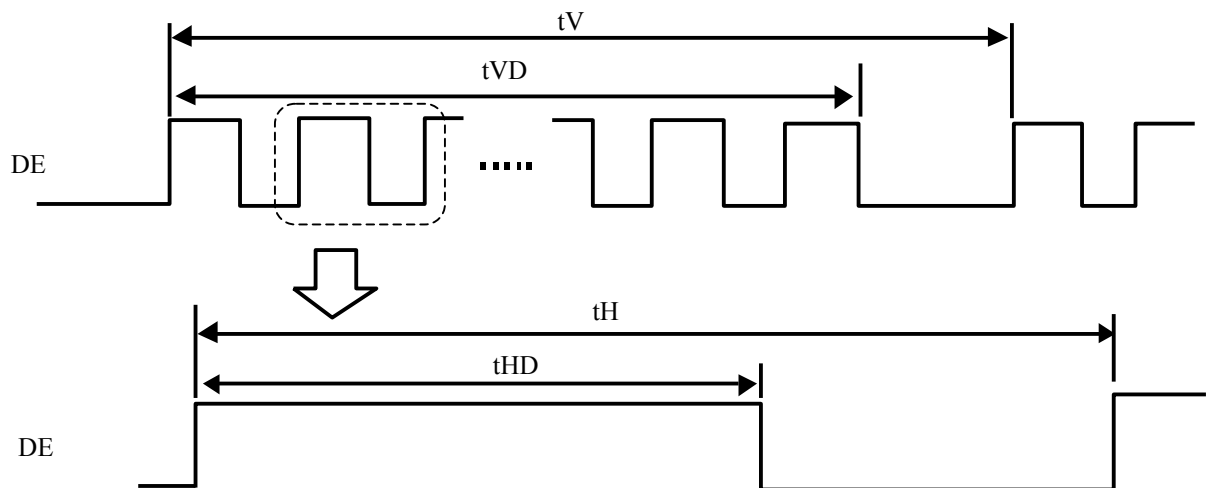
2) Data: 1:High,   0:Low

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6. INTERFACE TIMING

6.1 LVDS receiver timing

Rx0=(Rx0+)-(Rx0-)
Rx1=(Rx1+)-(Rx1-)
Rx2=(Rx2+)-(Rx2-)
Rx3=(Rx3+)-(Rx3-)
CLK=(CLK+)-(CLK-)

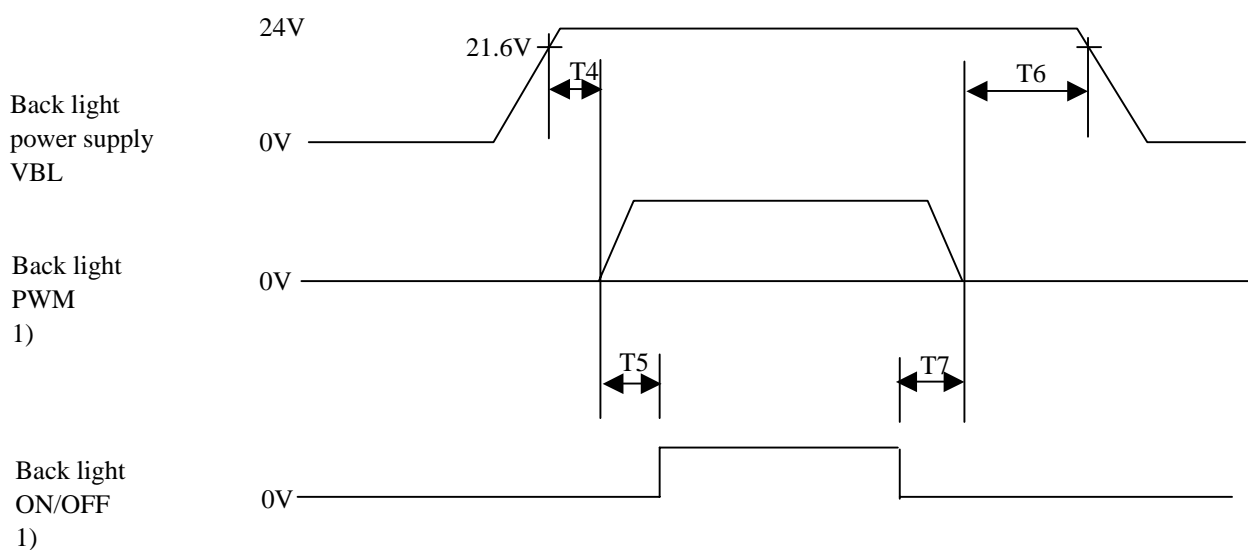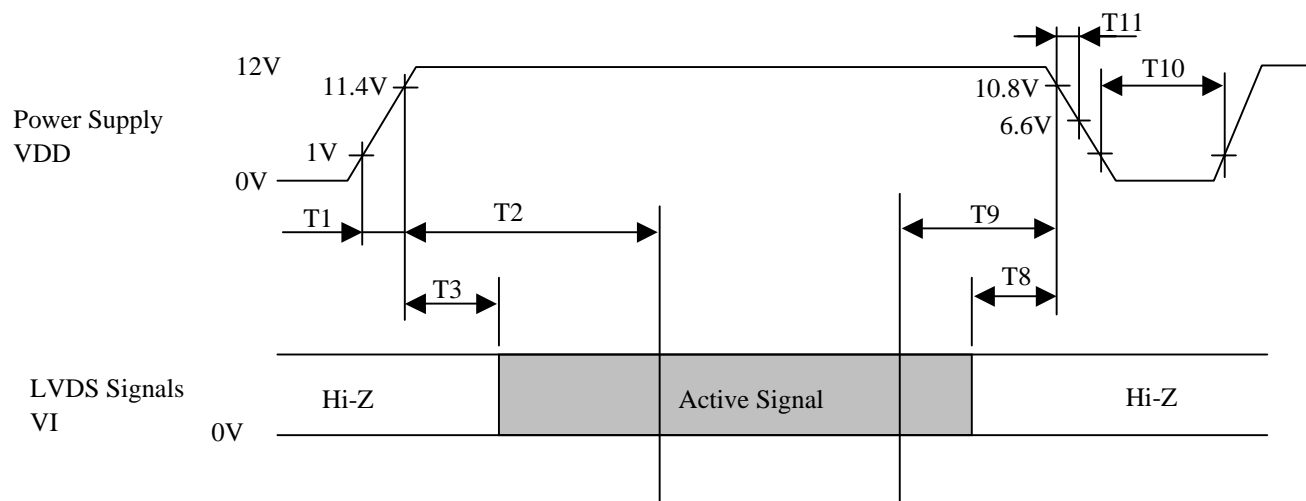|	Item	Symbol	Min	Typ	Max	Unit
RCLK	Frequency	tCLK	65	82	85	MHz
Rx0 Rx1 Rx2 Rx3	0 data position	tRIP0	1/7tCLK - 0.41	1/7tCLK	1/7tCLK + 0.41	ns
	1st data position	tRIP1	-0.41	0	+0.41	
	2nd data position	tRIP2	6/7tCLK - 0.41	6/7tCLK	6/7tCLK + 0.41	
	3rd data position	tRIP3	5/7tCLK - 0.41	5/7tCLK	5/7tCLK + 0.41	
	4th data position	tRIP4	4/7tCLK - 0.41	4/7tCLK	4/7tCLK + 0.41	
	5th data position	tRIP5	3/7tCLK - 0.41	3/7tCLK	3/7tCLK + 0.41	
	6th data position	tRIP6	2/7tCLK - 0.41	2/7tCLK	2/7tCLK + 0.41	

6.2 SYNCRONIZATION SIGNAL TIMING

I)50Hz

	ITEM	SYMBOL	Min.	Typ.	Max.	UNIT	NOTE
DE	Vertical frequency	fV	48	50	52	Hz	
	Vertical period	tV	773	860	1000	tH	
	Vertical valid	tVD		768		tH	
	Horizontal frequency	fH	-	43	-	kHz	
	Horizontal period	tH	1400	1814	2000	tCLK	
	Horizontal valid	tHD		1366		tCLK	

II)60Hz

	ITEM	SYMBOL	Min.	Typ.	Max.	UNIT	NOTE
DE	Vertical frequency	fV	58	60	62	Hz	
	Vertical period	tV	773	773	1000	tH	
	Vertical valid	tVD		768		tH	
	Horizontal frequency	fH	-	46.4	-	kHz	
	Horizontal period	tH	1400	1833	2000	tCLK	
	Horizontal valid	tHD		1366		tCLK	

6.3 TIMING BETWEEN INTERFACE SIGNALS POWER SUPPLY

0.5 ≦ T1 ≦ 10   0 ≦ T6
350 ≦ T2   0 ≦ T7
10 ≦ T3   0 ≦ T8
200 ≦ T4   0 ≦ T9
200 ≦ T5   1000 ≦ T10
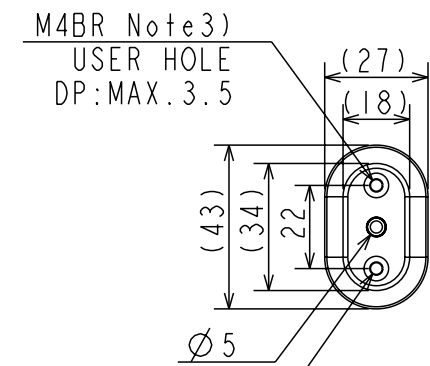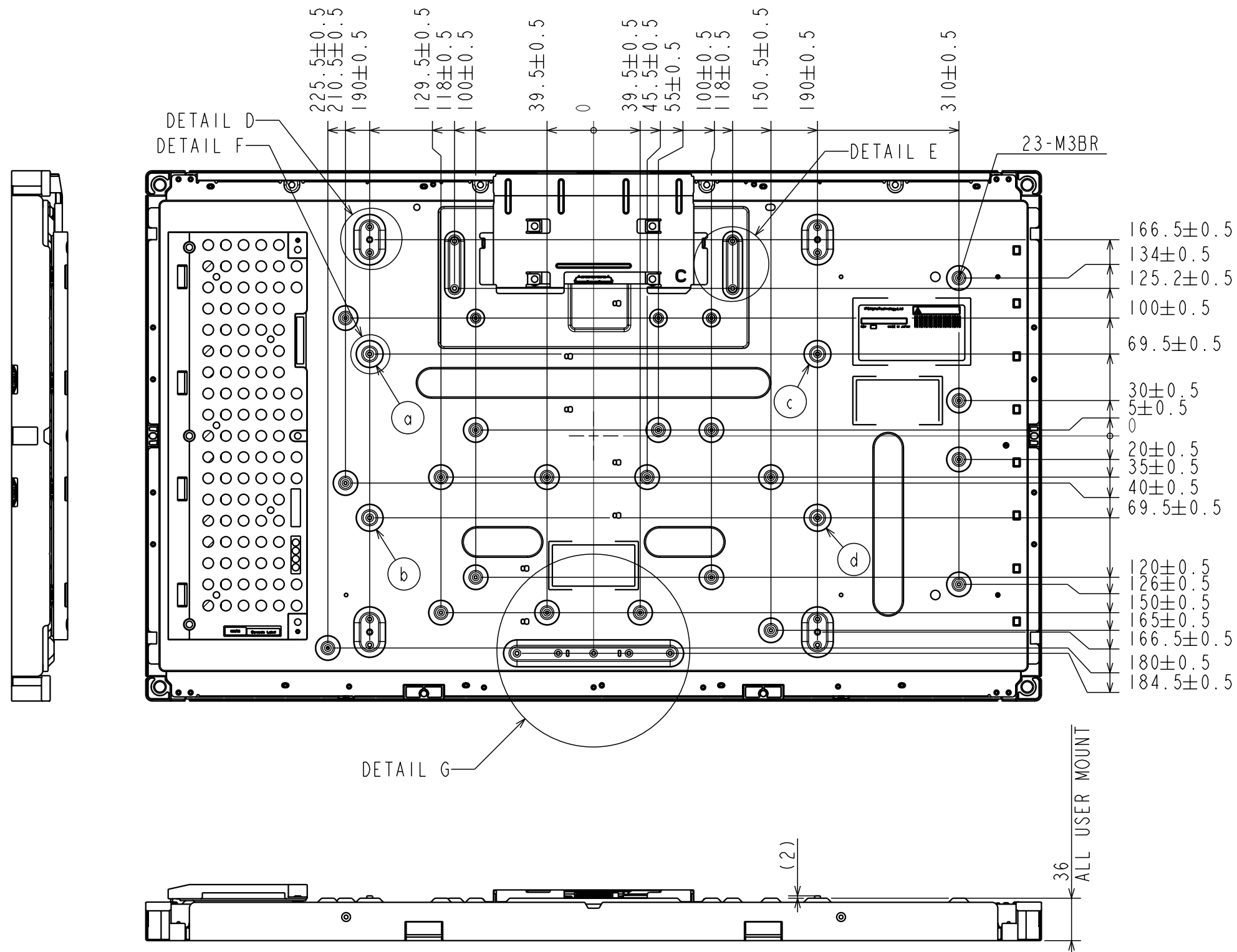   10 < T11   Unit : ms

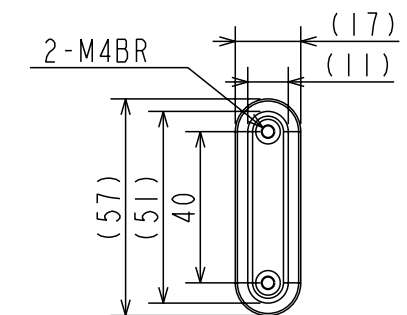Note 1) In all periods, the backlight ON/OFF signal voltage and the PWM signal voltage should be lower than
the backlight power supply voltage.

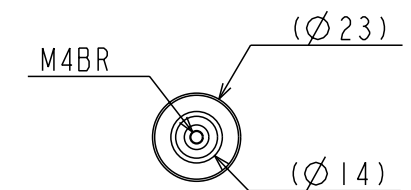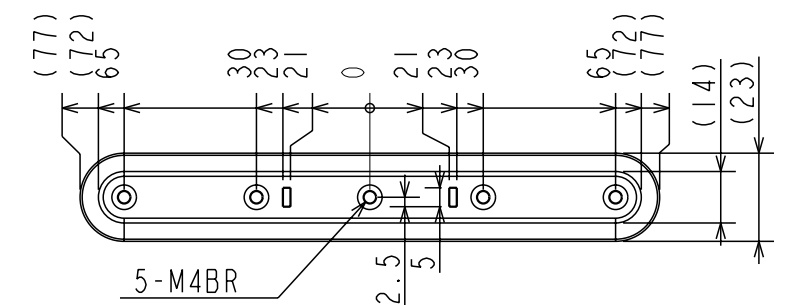| IPS Alpha Technology, Ltd. | Date | Dec. 05, 2008 | Sheet No. | ATD0934 2609   AX080B048G | Page | 9-3/3 |

7. DIMENSIONAL OUT LINE

(1) FRONT VIEW
TENTATIVE

DETAIL A (1:1)

SECTION Y2-Y2

DETAIL B (1:1)

SECTION XC-XC

SECTION Y1-Y1

Note 1) The dimension in a parenthesis is a reference value.
2) Unspecified tolerance to be ±0.8

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(2)BACK VIEW I
TENTATIVE

M4BR Note3)
USER HOLE
DP:MAX.3.5

DETAIL D
(1:2)

M4BR Note3)
USER HOLE
DP:MAX.3.5

DETAIL D
DETAIL F

DETAIL E

23-M3BR

DETAIL E
(1:2)

M4BR

DETAIL F
(1:2)
(a,b,c,d)

DETAIL G

ALL USER MOUNT

5-M4BR
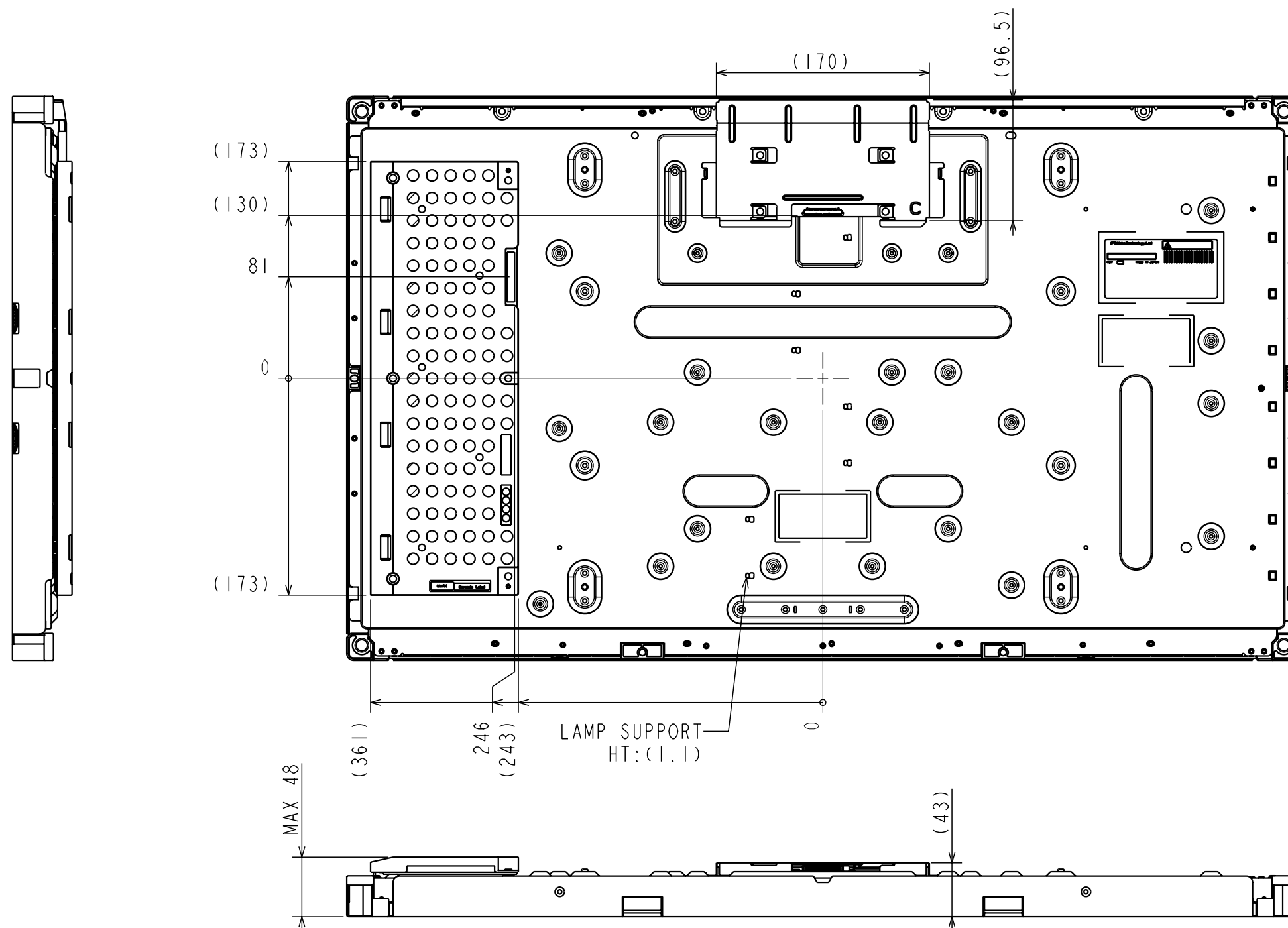
DETAIL G
(1:2)

Note 1) The dimension in a parenthesis is a reference value.
2) Unspecified tolerance to be ±0.8
3) Torque MAX. 1.47N·m(15kgf·cm)

(3)BACK VIEW 2
TENTATIVE

(170)

(96.5)

(173)
(130)
81
0
(173)

C

(361)
246
(243)

LAMP SUPPORT
HT:(1.1)

MAX 48

(43)

Note 1) The dimension in a parenthesis is a reference value.
2) Unspecified tolerance to be ±0.8

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